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PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re:	Patent Application of Kenji OKADA	: Group Art Unit:
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		:
Conf. No.:	Not Yet Assigned	:
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Appln. No.:	Not Yet Assigned	: Examiner:
		:
Filed:	Herewith	:
		: Attorney Docket
For:	Disk Drive and Control Method	: No. 8861-418US
	Therefor	: (P24477-02)

PRELIMINARY AMENDMENT

Simultaneously with the filing of the above-identified application with which this Preliminary Amendment is being filed, and prior to the calculation of the filing fee, Applicant hereby amends the application as follows, without prejudice:

In the Claims:

Please amend the claims as follows:

Please amend claims 8, 10, 12, 16, and 24 to read as follows:

8. A disk drive in accordance with claim 1, further comprising:

an impact detection section for detecting an impact caused by the behavior of said magnetic ball, and a rotation speed detection section for detecting the rotation speed of said disk at the time of the detection of said impact, wherein said impact detection section detects the timing of the separation of said magnetic ball from said magnet, and said rotation speed detection section detects the rotation speed of said disk at the timing of said separation.

10. A disk drive in accordance with claim 7, wherein said impact detection section detects an impact on the basis of the output signal of said optical pickup.

12. A disk drive in accordance with claim 7, wherein said impact detection section is a piezoelectric ceramic sensor.

16. A disk drive in accordance with claim 14, comprising:
an impact detection section for detecting an impact caused by the behavior of said magnetic ball, and a rotation speed detection section for detecting the rotation speed of said disk at the time of the detection of said impact, wherein said impact detection section detects the timing of the separation of said magnetic ball from said magnet, and said rotation speed detection section detects the rotation speed of said disk at the timing of said separation, and said impact detection section detects the timing of the attraction of said magnetic ball by said magnet, and said rotation speed detection section detects the rotation speed of said disk at the timing of said attraction.

24. A disk drive in accordance with claim 1, further comprising:
a behavior detection section for detecting the behavior of said magnetic ball, and a rotation speed detection section for detecting the rotation speed of said disk, wherein said behavior detection section detects the timing of the separation of said magnetic ball from said magnet, and said rotation speed detection section detects the rotation speed of said disk at the timing of said separation.

A marked-up copy of the amended claims is attached hereto, having the bracketed additions and stricken deletions.

REMARKS

Claims 1 to 31 are pending in the application.

The purpose of this amendment is to place the claims in appropriate U.S. form and delete the multiple dependent claims in this application, and thereby eliminate excessive claim fees. Such amendments are formal in nature and no new matter is added by any of the

above amendments. A marked-up copy of the amended claims is enclosed to reflect these amendments. Entry of this amendment and early examination of this application are respectfully solicited.

Respectfully submitted,

Kenji OKADA

11/13/01

(Date)

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Enclosure

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- 127 -

CLAIMS

1. A disk drive comprising:

a disk,

an optical pickup for recording information on said disk or for reproducing information recorded on said disk,

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section, wherein

said magnetic ball is separated from said magnet by rotating said disk in a state wherein said optical pickup is not processing an input signal derived from light reflected by the face of said disk and said optical pickup is not writing information on said disk.

2. A disk drive in accordance with claim 1, wherein

said process of separating said magnetic ball from said magnet is carried out in a spin-up process at the start of said disk drive.

3. A disk drive comprising:

a disk,

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section, wherein

in the case when the rotation speed of said disk is changed from a first rotation speed including a stop state to

1000355 11301

caused by the behavior of said magnetic ball.

7. A disk drive comprising:

a disk,

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section,

an impact detection section for detecting an impact caused by the behavior of said magnetic ball, and

a rotation speed detection section for detecting the rotation speed of said disk at the time of the detection of said impact.

8. A disk drive in accordance with claim 1, ~~3, 4 or 7~~ further comprising:

an impact detection section for detecting an impact caused by the behavior of said magnetic ball, and

a rotation speed detection section for detecting the rotation speed of said disk at the time of the detection of said impact, wherein

said impact detection section detects the timing of the separation of said magnetic ball from said magnet, and

said rotation speed detection section detects the rotation speed of said disk at the timing of said separation.

9. A disk drive in accordance with claim 7, wherein

said impact detection section detects the timing of the attraction of said magnetic ball by said magnet, and

said rotation speed detection section detects the rotation speed of said disk at the timing of said attraction.

10. A disk drive in accordance with claim 7 ~~or 9~~, wherein

said impact detection section detects an impact on the basis of the output signal of said optical pickup.

11. A disk drive in accordance with claim 10, wherein said impact detection section detects an impact on the basis of the focus error signal or the tracking error signal of said optical pickup.

12. A disk drive in accordance with claim 7 ~~or 9~~, wherein

said impact detection section is a piezoelectric ceramic sensor.

13. A disk drive comprising:

a disk,

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section, wherein

in the case when the rotation speed of said disk is changed from a first rotation speed to a second rotation speed lower than the first rotation speed,

said case includes a case wherein after the rotation speed is lowered from the first rotation speed to a third rotation speed lower than the second rotation speed, the third rotation

1009356 44304

speed is changed to the second rotation speed, and

said magnetic ball is attracted by said magnet at the third rotation speed.

14. A disk drive comprising:

a disk,

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section, wherein

in the case when reproduction or recording is carried out continuously in a region from a position to another position on said disk,

when the maximum value of the disk rotation speed in said region is lower than a separation rotation speed at which said magnetic ball separates from said magnet and higher than an attraction rotation speed at which said magnetic ball is attracted by said magnet, and

when the minimum value of the disk rotation speed in said region is said attraction rotation speed or less,

said case includes a case wherein the rotation speed of said disk is set at said attraction rotation speed or less before reproduction or recording.

15. A disk drive in accordance with claim 14, wherein

the relationship expression of $f_0 \times \{(\text{the rotation speed at the innermost periphery}) / (\text{the rotation speed at the outermost periphery})\} < f_1$ is established, wherein f_1 designates

1000355-113001

the rotation speed at which said magnetic ball separates and f0 designates the rotation speed at which said magnetic ball is attracted.

16. A disk drive in accordance with claim 14 ~~or 15~~, comprising:

an impact detection section for detecting an impact caused by the behavior of said magnetic ball, and

a rotation speed detection section for detecting the rotation speed of said disk at the time of the detection of said impact, wherein

said impact detection section detects the timing of the separation of said magnetic ball from said magnet, and said rotation speed detection section detects the rotation speed of said disk at the timing of said separation, and

said impact detection section detects the timing of the attraction of said magnetic ball by said magnet, and said rotation speed detection section detects the rotation speed of said disk at the timing of said attraction.

17. A disk drive comprising:

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section, and

a behavior detection section for detecting the behavior of said magnetic ball.

18. A disk drive in accordance with claim 17, wherein

the housing of said ring-shaped hollow section is formed of a transparent material, and

said behavior detection section is a photosensor.

19. A disk drive in accordance with claim 18, wherein the housing of said ring-shaped hollow section has a light-gathering section.

20. A disk drive in accordance with claim 17, wherein the housing of said ring-shaped hollow section is formed of a nonmetallic material, and

said behavior detection section is an electrostatic capacitance type sensor.

21. A disk drive in accordance with claim 17, wherein a determination is made as to whether said magnetic ball is rolling along the external peripheral face of said ring-shaped hollow section or not by comparing the period of the output signal of said behavior detection section with the period of the output signal of a rotation speed detection section for detecting the rotation speed of said disk.

22. A disk drive in accordance with claim 17, wherein a determination is made as to whether said magnetic ball has been attracted by said magnet or not on the basis of the output signal of said behavior detection section.

23. A disk drive in accordance with claim 17, wherein a determination is made as to whether said magnetic ball is rolling along the external peripheral face of said ring-shaped hollow section or not by comparing the period of

10009356 44304

another determination is made as to whether said magnetic ball has been attracted by said magnet or not on the basis of the output signal of said behavior detection signal, and

24. A disk drive in accordance with claim 1, ~~3, 4 or~~
~~17~~ further comprising:

a rotation speed detection section for detecting the rotation speed of said disk, wherein

said rotation speed detection section detects the rotation speed of said disk at the timing of said separation.

a rotation speed detection section, wherein
said behavior detection section detects the timing
of the attraction of said magnetic ball by said magnet, and

said rotation speed detection section detects the rotation speed of said disk at the timing of said attraction.

said rotation speed detection section detects the rotation speed of said disk at the timing of said separation,

said rotation speed detection section detects the rotation speed of said disk at the timing of said attraction.

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section,

a step for raising the rotation speed from the first rotation speed to a third rotation speed higher than the second rotation speed, and

said magnetic ball separates from said magnet at the third rotation speed.

a balancer for movably accommodating one or plural magnetic balls in the ring-shaped hollow section thereof and provided with a magnet for attracting said magnetic balls inside said ring-shaped hollow section,

a step for lowering the rotation speed from the first rotation speed to a third rotation speed lower than the second rotation speed, and

said magnetic ball is attracted by said magnet at the third rotation speed.

30. A disk drive in accordance with claim 29, wherein said impact detection section detects an impact on the basis of the focus error signal or the tracking error signal of said optical pickup.

31. A disk drive in accordance with claim 8, wherein
said impact detection section is a piezoelectric
ceramic sensor.